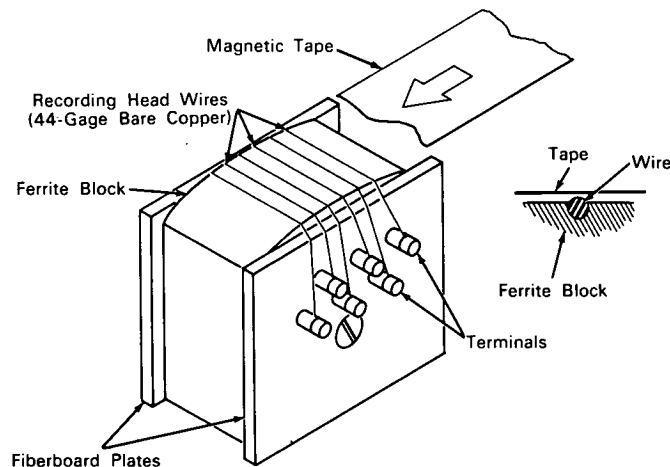


NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the NASA space program.

Small Digital Recording Head Has Parallel Bit Channels, Minimizes Cross Talk



The problem: A single wire carrying large current pulses has been used to record digital information on a moving magnetic tape. Recording information in parallel bit channels on the magnetic tape can be accomplished by using a number of these wires in parallel. (The recorded data can then be read serially by a conventional recording head.) The use of several single-wire elements to provide a parallel-bit recording head would ordinarily require a unit of relatively large size, because the wires must be widely separated from one another to minimize cross talk. A more compact recording head is needed.

The solution: A recording head consisting of closely spaced parallel wires imbedded in a ferrite block to concentrate the magnetic flux. Used in conjunction with an electronic circuit which records zeros and ones in succession, the multiple recording head serves as a shift register, i.e., it converts parallel-recorded information bits into serial information bits on a moving magnetic tape.

How it's done: A block of ferrite (or other suitable material of high magnetic permeability) having a thickness approximately equal to the width of the magnetic tape serves as a mechanical support and a flux concentrator for the recording-head wires. The wires are imbedded to more than half their diameter in parallel grooves in the face of the ferrite block. One end of each wire is attached to a common terminal (not shown) and the other end is attached to a separate current-driver terminal. The terminals are fastened to fiberboard insulating plates attached to the ferrite block. The coated surface of the magnetic tape passes over the wires in the ferrite.

Notes:

1. Instead of imbedding the individual wires in a ferrite surface, an improved design can be made by grooving the top surface of a ferrite block, plating with copper, and grinding the copper plating so that the upper surfaces of the copper strips remain-

(continued overleaf)

ing in the grooves are flush with the surface of the ferrite block. Printed and etched circuitry techniques may also offer advantages.

2. A recording head made according to this principle should be investigated further to determine possible limitations, such as interword gaps, high current, and low pulse-packing density. Development of a magnetic recording head using this principle could provide a very low driving-point impedance head for pulse and digital recording applications.

3. For further information about this innovation inquiries may be directed to:

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Reference: B63-10284

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Jet Propulsion Laboratory
under contract to the U. S. Army
(JPL-0029)